REMARKS

New claims 21-25 have been added to more precisely define the features of the reactor of claim 1. Support for new claim 21 which recites reduction in gas and particle entrainment in the reaction chamber and efficient mixing in the homogenization section will be found in the disclosure of the specification at page 4, line 35 to page 5, line 1. Support for new claim 22 in which the reaction chamber comprises a straight region and a convergent section will be found in the disclosure of the specification at page 14, lines 6-10. Support for new claim 23 which recites a subsonic reactor will be found on page 14, lines 36-38. Support for the gas pressure of the carrier gas of new claim 24 will be found in the disclosure of the specification at page 15, lines 4-5. Support for the location of the reactant inlets and the recited function of claim 25 will be found in the disclosure of the specification at page 14, lines 11-14. As such, it is not believed that new matter is being presented in the new claims. Accordingly, entry of the new claims submitted herewith is respectfully requested.

Informal objections were raised in the Office action for duplication of the words "chamber" and "the" in the specification and claims. The examiner is thanked for so carefully reviewing the specification and appropriate corrections have been made in the Amendment.

Claims 1-8, 17-18 and 20 are rejected in the Office action as anticipated by US 3051639 of Anderson.

The claims relate to the production of nanoparticles and recite features that contribute to the production of nanoparticles. In contrast, Anderson does not disclose the production of nanoparticles. Anderson only relates to the production of unsaturated hydrocarbons, such as acetylene, by pyrolysis of fluid hydrocarbons, such as methane. With regard to the production of solid, Anderson mentions the formation of large quantities of carbon black as a disadvantage associated with prior hydrocarbon pyrolysis processes using an electric arc, see Col. 1, lines 14-27 and Example IX mentions a decrease in carbon formation. Nothing is said in Anderson that the undesired carbon is in the form of nanoparticles.

Hence, contrary to the comment in the Office action that Anderson "teaches a reactor for the production of nanoparticles...", Anderson does not anticipate or render obvious the claimed nanoparticle production.

In regard to the features of the claims that contribute to the production of nanoparticles, in particular, claims 1, 9 amd 17 each recite a spacer zone of the reaction chamber having a length L_1 and a homogenization zone having a length L_2 and that L1 is sufficient for the hot carrier gas to attach to the wall of the spacer zone of the reaction chamber prior to the reactant inlets and L2 being sufficient for a residence time of the reactants within the homogenization zone suitable for forming the reaction product. Claims 18 and 19 additionally recite that the overall length of $L_1 + L_2$ is designed to a residence time

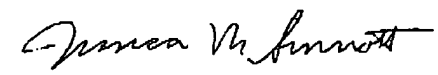
sufficient that the following three tasks are completed before gas flow exiting the homogenizer: (1) gas flow in the reaction chamber has achieved a near one-dimensional flow and concentration profile; and (2) gas-phase nucleation of product particles has been initiated. Claim 20 recites L1 of the spacer zone must be long enough to have the hot gas flow attach to walls of the reaction chamber before the hot gas reaches the reactant inlets and the overall length (L1 + L2) of the reaction chamber is designed to a residence time sufficient that before gas flow exits the homogenizer: gas flow in the reaction chamber has achieved a near one dimensional flow and concentration profile. In contrast, Anderson does not teach a spacer zone having a length L_1 which is of sufficient length for the hot carrier gas to attach to the wall of the spacer zone of the reaction chamber prior to the reactant inlets. Anderson merely shows fluid hydrocarbon inlet 48 of Fig 1 located above a cylindrical reaction chamber, the inlets are pointed upwards towards the gas stream. Nothing is disclosed in Anderson about the dimensions of any lengths of the reaction chamber and since Anderson does not relate to the production of nanoparticles, nothing in Anderson would have disclosed or suggested the relevance of the lengths of a spacer zone and a homogenization zone.

Hence, contrary to the comment in the Office action, Anderson does not anticipate or render obvious the claims.

Claims 9-16 are cancelled without prejudice.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,



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